

October 1999

Estimates of the Benefits and Detriments of Electric Industry Restructuring in North Carolina

Volume 2: Detailed Results— Sensitivity Analyses Final Report

Prepared for

Legislative Study Commission on the
Future of Electric Service in North Carolina
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RTI Project Number 7135-052

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Acknowledgments

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Executive Summary

In Task 5 of Research Triangle Institute's (RTI's) project to investigate the restructuring of North Carolina's electric utility industry, we estimate the economic benefits and detriments of restructuring the electric utility industry. This volume is the companion to Volume 1, which provided an overview of the study's methodology and a summary of results. Volume 2 describes the sensitivity analyses we conducted to test the sensitivity of our reference case results to alternative assumptions.

We define economic benefits and detriments in terms of North Carolina output, employment, and earnings. An increase in any of these measures as a result of restructuring is an economic benefit. A decrease in any of these measures as a result of restructuring is an economic detriment. We estimated changes in all three measures—output, employment, and earnings. We chose to present statewide net changes in employment as the best summary measure of the economic benefits and detriments of restructuring the North Carolina electricity industry. The changes in output and earnings move in the same direction as the changes in employment.

The basic results are framed in terms of our reference case. We define the reference case as follows:

- restructuring is assumed to commence in 2004,
- a uniform ¢/kWh surcharge on electricity prices recovers 100 percent of stranded costs over a 5-year recovery period, and
- rates are realigned so that rates by customer class more closely track the incremental costs of serving each class.

This reference case is established to simplify the presentation of results, not as a set of policy prescriptions. The principal feature of the rates realignment is that industrial rates decline and residential rates increase. Rates realignment occurs as a result of the action of competitive market forces in a restructured market.

To conduct the sensitivity analyses of our reference case results to alternative assumptions, we ran seven alternative sensitivity scenarios for comparison to the reference case. The seven alternatives differ with respect to

- whether stranded costs are recovered,
- whether rates realign, and
- when restructuring commences.

Taken together, the scenarios are designed to offer a range of alternative estimates of the benefits and detriments of restructuring.

Economic benefits and detriments occur as a result of differences in electricity prices between any given policy scenario and the base case. The largest prices differences are for industrial customers. Price reductions for residential and commercial customers are relatively modest. In fact, under the restructuring assumed in the reference case, prices for residential customers are lower than those in the base case of no institutional change in only three of the 12 years analyzed.

Cumulative net changes in employment over the time period 2004 through 2015 are a useful summary measure of the balance between economic benefits and economic detriments. The year 2015 is used as an endpoint because we used U.S. Department of Commerce projections of economic activity as trend projections in our analysis, and 2015 was the last year in those projections.

For any scenario, the total cumulative employment effects are relatively small when compared to a North Carolina employment base that averages 5,100,000 jobs over the 2004 through 2015 period. Comparison of sensitivity scenario A with the reference case indicates that a large portion of the estimated economic benefits are due to the effects of rates realignment. Rates realignment would be a result of restructuring, but rates realignment could also be accomplished by regulatory innovation and initiative without restructuring. Average annual net employment changes range from

- job gains of 14,300 under a scenario (scenario B) that assumes no stranded cost recovery, no rates realignment, and restructuring begins in 2002 to
- job losses of 3,800 under a scenario (scenario E) that assumes 100 percent recovery of stranded costs, no rates realignment, and restructuring begins in 2002.

The most prominent result of our analysis is the relatively modest impact of electricity market restructuring on employment in North Carolina. As expected, the general effect is a net positive gain in employment, but the size of this gain is not large relative to the overall base of employment in North Carolina. In our reference case, the average annual net employment change over the 2004 through 2015 period is a gain of 1,100 jobs per year compared to the base case.

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Introduction

The basic results of our estimates of economic benefits and detriments associated with electricity market restructuring in North Carolina are framed in terms of our reference case. In the reference case, restructuring is assumed to commence in 2004. A uniform ¢/kWh surcharge on electricity prices recovers 100 percent of stranded costs over a 5-year recovery period.

In the reference case, we also assume that in a restructured market competition will cause a realignment of rates. The principal feature of this rates realignment is that industrial rates decline and residential rates increase.

To test the sensitivity of our reference case results to alternative assumptions, we ran seven alternative sensitivity scenarios for comparison to the reference case. The distinguishing characteristics of the seven sensitivity scenarios are as follows:

- Is there recovery of stranded costs?
- Is there a realignment of rates?
- When does restructuring commence?

Our reference case is based on restructuring commencing in 2004 and 100 percent recovery of stranded costs. Sensitivity scenario A also assumes that restructuring commences in 2004 and that there is 100 percent recovery of stranded costs. But sensitivity scenario A does not incorporate the rates realignment feature that is a part of our reference case.

To test the sensitivity of our reference case results to the timing of restructuring, we accelerate the beginning of restructuring in

sensitivity scenarios B and C. In these two scenarios, we also assume that there is no recovery of stranded costs. There *is* rates realignment in sensitivity scenario B. There is *not* rates realignment in sensitivity scenario C. In both sensitivity scenarios B and C, we use the hypothetical assumption that restructuring commences in 2002.

To compare the combination of an accelerated commencement of restructuring *and* 100 percent recovery of stranded costs with our reference case, we created sensitivity scenarios D and E. In each of these sensitivity scenarios, restructuring commences in 2002 and there is 100 percent recovery of stranded costs. Sensitivity scenario D includes rates realignment and sensitivity scenario E does not.

We also test the sensitivity of our reference case results to a slower timetable for the commencement of restructuring. In sensitivity scenario F, the beginning of restructuring is delayed until 2006. In sensitivity scenario F, just as in the reference case, there is 100 percent recovery of stranded costs and rates realignment. Sensitivity scenario G is like sensitivity scenario F in every detail except that there is no rates realignment.

The reference case and the sensitivity scenarios are identified in Table 1-1. The distinguishing characteristics section of Table 1-1 explains how the sensitivity scenarios differ from the reference case and from each other.

Table 1-1. The Sensitivity Scenarios and Their Distinguishing Characteristics

Sensitivity Scenario	Distinguishing Characteristics
Reference Case	100 Percent Stranded Cost Recovery Rates Realignment Restructuring Begins 2004
A	100 Percent Stranded Cost Recovery No Rates Realignment Restructuring Begins 2004
B	No Stranded Cost Recovery Rates Realignment Restructuring Begins 2002
C	No Stranded Cost Recovery No Rates Realignment Restructuring Begins 2002
D	100 Percent Stranded Cost Recovery Rates Realignment Restructuring Begins 2002
E	100 Percent Stranded Cost Recovery No Rates Realignment Restructuring Begins 2002
F	100 Percent Stranded Cost Recovery Rates Realignment Restructuring Begins 2006
G	100 Percent Stranded Cost Recovery No Rates Realignment Restructuring Begins 2006

2

Sensitivity Analyses

2.1 INTRODUCTION

We define economic benefits and detriments in terms of North Carolina output, employment, and earnings. Output is the annual dollar value of all raw materials, intermediate goods and final goods, and services produced in North Carolina. Employment is full-time person-years of work. Two half-time jobs equal one full-time employment year, or full-time job. Earnings are employee compensation. An increase in any of these measures as a result of restructuring is an economic benefit. A decrease in any of these measures as a result of restructuring is an economic detriment. Our model estimates the changes in each of these three measures of economic benefits and detriments for 31 business, industry, and government groups that encompass 100 percent of the economy of North Carolina.¹ The estimates of benefits and detriments are also separated into the seven economic development regions of North Carolina.

We chose statewide net changes in employment as the best summary measure of the economic benefits and detriments of restructuring the North Carolina electricity industry. The sensitivity analysis results presented in this section focus on the employment dimension of economic benefits and detriments.

¹These 31 business, industry, and government groups are the groupings used by the North Carolina Department of Administration, Office of Management and Budget in many of its analyses.

2.2 PRICES

We use the economic model to generate different estimates of North Carolina employment for the period from the assumed commencement of restructuring through 2015. The different estimates of North Carolina employment depend on differences in electricity prices between the restructuring scenario being evaluated and a base case of no institutional change. In the base case of no institutional change, rate base/rate of return regulation with exclusive franchise territories is assumed to continue from now through 2015. Prices for the base case are derived from revenue requirements projections supplied to RTI by North Carolina utilities. Separate prices are identified for the separate major customer classes-residential, commercial, and industrial.

Table 2-1 presents the no institutional change, base case prices. Prices for our reference case are presented in Table 2-2. Prices for sensitivity scenarios A, B, C, D, E, F, and G are presented in Tables 2-3 through 2-9, respectively.

Differences between the reference case prices and the base case prices drive the results for the reference case. Differences between prices for each of the sensitivity scenarios and the base case prices also drive the results for each of the sensitivity scenarios. The 2004 through 2015 prices for the base case of no institutional change, the reference case and a marginal cost case (scenario B) are graphically displayed for each customer class in Figures 3-4 through 3-6 in Volume 1.

2.3 SENSITIVITY ANALYSIS RESULTS

We focus on the average annual net employment change for each sensitivity scenario as a summary measure of economic benefits and detriments. It is convenient and appropriate to think of this measure as the effects of alternative restructuring scenarios on jobs in North Carolina. In all cases (the reference case and each sensitivity scenario), the effect on jobs is in comparison to the base case of no institutional change.

We break the total effects on jobs into two components. The first component is the average annual employment change for the period in which stranded costs are recovered. The second

Table 2-1. Base Prices with No Institutional Change

		In 1995 ¢/kWh												
Electricity Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector														
Residential	7.319	7.342	7.320	7.326	7.315	7.298	7.314	7.285	7.281	7.273	7.276	7.283	7.273	7.274
Commercial	5.810	5.828	5.810	5.815	5.807	5.793	5.805	5.783	5.780	5.773	5.776	5.781	5.773	5.774
Industrial	4.355	4.369	4.355	4.359	4.353	4.342	4.352	4.335	4.333	4.327	4.330	4.334	4.328	4.328

Note: These prices are based on the assumption of continued franchised service territories with rate base/rate of return regulation.

Table 2-2. Reference Case Prices

Distinguishing Characteristics: 100 Percent Stranded Cost Recovery
Rates Realignment
Restructuring Begins 2004

		In 1995 ¢/kWh												
Electricity Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector														
Residential	7.319	7.342	7.806	7.872	7.879	7.909	7.961	7.083	7.160	7.254	7.318	7.421	7.484	7.547
Commercial	5.810	5.828	5.919	5.969	5.975	5.997	6.036	5.371	5.429	5.501	5.549	5.627	5.674	5.723
Industrial	4.355	4.369	4.331	4.367	4.371	4.388	4.416	3.929	3.972	4.025	4.060	4.117	4.152	4.187

Note: Years for which stranded costs are recovered are shown in bold. These prices are based on the assumption that in a restructured electricity market, relative prices will change to reflect equalized rates of return across customer classes.

Table 2-3. Sensitivity Scenario A Prices

Distinguishing Characteristics: 100 Percent Stranded Cost Recovery
No Rates Realignment
Restructuring Begins 2004

		In 1995 ¢/kWh												
Electricity Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector														
Residential	7.319	7.342	7.563	7.626	7.634	7.662	7.712	6.862	6.936	7.028	7.090	7.190	7.250	7.312
Commercial	5.810	5.828	6.003	6.053	6.060	6.082	6.122	5.447	5.506	5.579	5.628	5.707	5.755	5.804
Industrial	4.355	4.369	4.500	4.538	4.542	4.559	4.589	4.083	4.127	4.182	4.219	4.278	4.314	4.351

Note: Years for which stranded costs are recovered are shown in bold. These prices are based on the assumption that restructuring causes no changes in relative prices by customer class (residential, commercial, industrial) vis-à-vis the current pattern of regulated prices.

Table 2-4. Sensitivity Scenario B Prices

Distinguishing Characteristics: No Stranded Cost Recovery
Rates Realignment
Restructuring Begins 2002

		In 1995 ¢/kWh												
Electricity Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector														
Residential	6.702	6.758	6.753	6.840	6.869	6.920	6.991	7.083	7.160	7.254	7.318	7.421	7.484	7.547
Commercial	5.082	5.124	5.120	5.186	5.208	5.247	5.301	5.371	5.429	5.501	5.549	5.627	5.674	5.723
Industrial	3.718	3.749	3.746	3.795	3.811	3.839	3.879	3.929	3.972	4.025	4.060	4.117	4.152	4.187

Note: These prices are based on the assumption of marginal cost based prices with no recovery of stranded costs and are also based on the assumption that in a restructured electricity market, relative prices will change to reflect equalized rates of return across customer classes.

Table 2-5. Sensitivity Scenario C Prices

Distinguishing Characteristics: No Stranded Cost Recovery
No Rates Realignment
Restructuring Begins 2002

		In 1995 ¢/kWh													
Electricity Prices		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector															
Residential		6.493	6.547	6.542	6.627	6.655	6.704	6.773	6.862	6.936	7.028	7.090	7.190	7.250	7.312
Commercial		5.154	5.197	5.193	5.260	5.282	5.321	5.376	5.447	5.506	5.579	5.628	5.707	5.755	5.804
Industrial		3.863	3.896	3.893	3.943	3.960	3.989	4.030	4.083	4.127	4.182	4.219	4.278	4.314	4.351

Note: These prices are based on the assumption of marginal cost based prices with no recovery of stranded costs and are also based on the assumption that restructuring causes no changes in relative prices by customer class (residential, commercial, industrial) vis-à-vis the current pattern of regulated prices.

Table 2-6. Sensitivity Scenario D Prices

Distinguishing Characteristics: 100 Percent Stranded Cost Recovery
Rates Realignment
Restructuring Begins 2002

		In 1995 ¢/kWh													
Electricity Prices		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector															
	Residential	8.170	8.196	8.161	8.219	8.220	6.920	6.991	7.083	7.160	7.254	7.318	7.421	7.484	7.547
	Commercial	6.195	6.214	6.188	6.232	6.233	5.247	5.301	5.371	5.429	5.501	5.549	5.627	5.674	5.723
	Industrial	4.532	4.547	4.527	4.560	4.560	3.839	3.879	3.929	3.972	4.025	4.060	4.117	4.152	4.187

Note: Years for which stranded costs are recovered are shown in bold. These prices are based on the assumption that in a restructured electricity market, relative prices will change to reflect equalized rates of return across customer classes.

Table 2-7. Sensitivity Scenario E Prices

Distinguishing Characteristics: 100 Percent Stranded Cost Recovery
 No Rates Realignment
 Restructuring Begins 2002

In 1995 ¢/kWh														
Electricity Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector														
Residential	7.915	7.940	7.906	7.962	7.963	6.704	6.773	6.862	6.936	7.028	7.090	7.190	7.250	7.312
Commercial	6.283	6.303	6.276	6.321	6.321	5.321	5.376	5.447	5.506	5.579	5.628	5.707	5.755	5.804
Industrial	4.710	4.725	4.704	4.738	4.738	3.989	4.030	4.083	4.127	4.182	4.219	4.278	4.314	4.351

Note: Years for which stranded costs are recovered are shown in bold. These prices are based on the assumption that restructuring causes no changes in relative prices by customer class (residential, commercial, industrial) vis-à-vis the current pattern of regulated prices.

Table 2-8. Sensitivity Scenario F Prices

Distinguishing Characteristics: 100 Percent Stranded Cost Recovery
 Rates Realignment
 Restructuring Begins 2006

In 1995 ¢/kWh														
Electricity Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector														
Residential	7.319	7.342	7.320	7.326	7.602	7.637	7.694	7.771	7.834	7.254	7.318	7.421	7.484	7.547
Commercial	5.810	5.828	5.810	5.815	5.764	5.791	5.834	5.893	5.940	5.501	5.549	5.627	5.674	5.723
Industrial	4.355	4.369	4.355	4.359	4.217	4.237	4.269	4.311	4.346	4.025	4.060	4.117	4.152	4.187

Note: Years for which stranded costs are recovered are shown in bold. These prices are based on the assumption that in a restructured electricity market, relative prices will change to reflect equalized rates of return across customer classes.

Table 2-9. Sensitivity Scenario G Prices

Distinguishing Characteristics: 100 Percent Stranded Cost Recovery
 No Rates Realignment
 Restructuring Begins 2006

In 1995 ¢/kWh														
Electricity Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sector														
Residential	7.319	7.342	7.320	7.326	7.365	7.399	7.454	7.529	7.590	7.028	7.090	7.190	7.250	7.312
Commercial	5.810	5.828	5.810	5.815	5.846	5.873	5.917	5.976	6.025	5.579	5.628	5.707	5.755	5.804
Industrial	4.355	4.369	4.355	4.359	4.382	4.403	4.435	4.480	4.516	4.182	4.219	4.278	4.314	4.351

Note: Years for which stranded costs are recovered are shown in bold. These prices are based on the assumption that restructuring causes no changes in relative prices by customer class (residential, commercial, industrial) vis-à-vis the current pattern of regulated prices.

component is the average annual employment change for the post-recovery of stranded costs period. We then present the results for the two periods combined (i.e., the total net change in employment from the assumed commencement of restructuring until 2015).

To illustrate this calculation, consider the reference case.

Restructuring is assumed to commence in 2004 and there is an annual average employment loss of 4,400 jobs per year for the stranded costs recovery period that covers 2004 through 2008. For the 5-year recovery period, this totals 22,000 jobs lost. However, for the post-recovery period, there is an annual average employment gain of 5,000 jobs per year. For the 7-year post-recovery period that covers 2009 through 2015, this gain totals 35,000 jobs. For the whole 12-year period under analysis in the reference case, the total net effect on employment is a gain of 13,000 jobs.² This is an average annual net employment effect of 1,100 jobs gained per year.

For each sensitivity scenario, the average annual net employment effect is calculated on the basis of the number of years covered by the period from the year in which restructuring is assumed to commence through 2015. For the reference case and sensitivity scenario A this is 12 years– 2004 through 2015. For sensitivity scenarios B, C, D, and E, this is 14 years– 2002 through 2015. For sensitivity scenarios F and G, this is 10 years– 2006 through 2015.

The average annual net employment changes for the reference case and each sensitivity scenario are deviations from the base case projections of North Carolina employment. The Bureau of Economics of the U.S. Department of Commerce projects that employment in North Carolina in 2002 will be 4,716,000 jobs and will grow to 5,542,000 jobs in 2015. This net employment growth of 826,000 jobs is equal to an average annual employment gain of 59,000 jobs over the 14 years.

The sensitivity analyses have expected results. These results are summarized in Table 2-10. The sensitivity scenario closest to the reference case is scenario A. In this scenario, restructuring is also

²Of course, for the two sensitivity scenarios that assume no recovery of stranded costs (sensitivity scenarios B and C), there is no "recovery period." The total 14-year period under analysis for these scenarios, 2002 through 2015, is in effect the "post-recovery period."

Table 2-10. Sensitivity Analysis Results

Scenario	Distinguishing Characteristics	Average Annual Employment Effects of Alternative Scenarios, 2002-2015		
		Recovery of Stranded Costs Period	Post- Recovery of Stranded Costs Period	Average Annual Net Employment Change
Reference Case	100 Percent Stranded Cost Recovery Rates Realignment Restructuring Begins 2004	- 4,400	5,000	1,100
A	100 Percent Stranded Cost Recovery No Rates Realignment Restructuring Begins 2004	- 10,200	3,300	- 2,300
B	No Stranded Cost Recovery Rates Realignment Restructuring Begins 2002	N/A	14,300	14,300
C	No Stranded Cost Recovery No Rates Realignment Restructuring Begins 2002	N/A	11,500	11,500
D	100 Percent Stranded Cost Recovery Rates Realignment Restructuring Begins 2002	- 13,200	6,400	- 600
E	100 Percent Stranded Cost Recovery No Rates Realignment Restructuring Begins 2002	- 19,000	4,700	- 3,800
F	100 Percent Stranded Cost Recovery Rates Realignment Restructuring Begins 2006	800	3,700	2,300
G	100 Percent Stranded Cost Recovery No Rates Realignment Restructuring Begins 2006	- 5,000	1,900	- 1,600

assumed to commence in 2004 and there is 100 percent recovery of stranded costs. But there is no rates realignment. Consequently, industrial prices are higher in scenario A than in the reference case, and as a result there is an average annual employment loss of 2,300 jobs per year over the 2004 through 2015 period. These job losses are not unemployment in the sense of people being laid off. Rather, they represent slower total job growth than would otherwise take place under the base case.

The two scenarios with no stranded cost recovery, B and C, have the largest average annual employment gains. Scenario B includes rates realignment and its 14,300 new jobs per year exceed the 11,500 new jobs per year for scenario C, which has no rates realignment.

To test the effect of accelerating the assumed starting date for restructuring, we used a hypothetical date of 2002 for commencement of restructuring under sensitivity scenarios D and E. An earlier starting date means larger stranded costs and higher stranded cost recovery surcharges. As one would expect, the result of this is large negative average annual employment effects during the stranded costs recovery period for each scenario. In sensitivity scenario D with rates realignment, the 13,200 job losses per year during the recovery period are smaller, and the annual job gains during the post-recovery period almost break even for the whole 2002 through 2015 period. In scenario E with no rates realignment, the larger job losses per year during the recovery period (19,000) and smaller job gains per year during the post-recovery period (4,700) result in a net average annual employment change for the whole 2002 through 2015 period of 3,800 jobs lost per year.

To test the effect of delaying the implementation of restructuring, we assume that restructuring commences in 2006 for sensitivity scenarios F and G. Because postponing restructuring means that total stranded costs are smaller and stranded cost recovery surcharges are smaller, we would expect to see smaller negative impacts on average annual employment effects in the stranded costs recovery period and this is what we see.

We also see once again that the impact of rates realignment is an important effect. For sensitivity scenario F, the positive effect on employment of rates realignment completely counterbalances the negative effect of the stranded costs recovery surcharge. During the stranded costs recovery period for scenario F, there is thus an actual positive average annual employment effect of 800 jobs gained per year for the 2006 through 2010 stranded cost recovery period. Together with the positive employment effect from the post-recovery period, this yields an average gain of 2,300 jobs per year for the whole 2006 through 2015 period for scenario F.

In contrast, without rates realignment, sensitivity scenario G experiences job losses during the stranded costs recovery period that are less than fully counterbalanced by job gains during the post-recovery period. The overall result for the 2006 through 2015 period for scenario G is an annual average net employment loss of 1,600 jobs per year.

2.4 CROSS-INDUSTRY COMPARISONS

With three measures of economic activity, eight restructuring scenarios, 31 industry/business groups, and seven economic development regions in the model, the number of possible cross-industry comparisons is very large. To give the reader a feel for the range of differences between industries across pricing scenarios, we compare two specific scenarios and two specific industries/businesses. Scenario B– marginal cost pricing with rates realignment and without recovery of stranded costs; this scenario offers the lowest industrial electricity prices in 2002 (see Table 2-4). Scenario E– recovery of stranded costs without rates realignment and also beginning restructuring in 2002; this scenario contains the highest industrial electricity prices (see Table 2-7).

The effects of these two scenarios vary dramatically across industry and business groups. Consider the difference between a typical manufacturing industry for which electricity prices are a relatively large component of total costs and a typical service-sector industry. For example, in the pulp and paper industry electricity costs make up 6.93 percent of total costs (Volume 1, Appendix Table A-1), and in a service-sector industry, such as finance, insurance, and real estate, electricity costs make up 2.48 percent of total costs.³ In addition, these two industries offer a nice contrast because of their relative sizes. Pulp and paper consists of roughly 0.5 percent of total state employment (roughly 25,000 workers), while finance, insurance, and real estate is almost ten times as large. For simplicity, we focus on employment changes for the year 2002 only.

³The pulp and paper industry is what analysts refer to as an “electricity-intensive” industry. Analysts note that the top 40 electricity-intensive industries account for 35 percent of manufacturing employment in North Carolina. See Lugar, Wu, and Komives, (1998). The industry groupings in this study do not correspond exactly to the industry groupings used in our model, but the same general pattern holds.

Table 2-11 shows that under Scenario B with rates realignment and with no recovery of stranded costs the gain in jobs in the pulp and paper industry is 580; whereas in the much larger finance, insurance, and real estate sector only 315 additional jobs are gained. This difference across industries derives largely from two factors:

- the larger role of electricity in the costs of production in pulp and paper, and
- the relatively lower electricity prices in the manufacturing sector resulting from realignment of rates due to competitive market adjustments that lead to equalization of rates of return across customer classes served.

Table 2-11. Change in Employment in 2002 Across Industries and Scenarios: North Carolina

Industry	Scenario B (change in the number of jobs)	Scenario E (change in the number of jobs)	Scenario B (percentage change in the number of jobs)	Scenario E (percentage change in the number of jobs)
Pulp and Paper	580	- 217	+2.23%	- 0.83%
Finance, Insurance, and Real Estate	315	- 17	+0.13%	- 0.01%

The relative size of the industries is also reflected in the percentage changes in each case. In Scenario B, the pulp and paper industry gains 2.23 percent, while the percentage increase in finance, insurance, and real estate is negligible.

Table 2-11 also shows the effects on employment in these two industries under the higher electricity prices that result from stranded cost recovery surcharges in Scenario E. Here, the higher electricity prices result in job losses in both industries; however, again, because of its smaller absolute size, the percentage effect is much larger in the pulp and paper industry. When stranded costs are recovered, pulp and paper loses roughly 1 percent of its work force, while finance, insurance, and real estate are essentially unaffected.

2.5 SUMMARY

The reference case is based on 100 percent recovery of stranded costs, competitive rates realignment that reduces prices for

industrial users relative to prices for residential users and commercial users, and restructuring commencing in 2004. Under these assumptions, we estimate that restructuring results in an average annual net employment gain of 1,100 jobs per year over the 2004 through 2015 period. This gain is equal to 0.02 percent of the projected North Carolina average annual employment base of 5,100,000 jobs over this time horizon.

These employment effects are calculated relative to baseline projections of North Carolina employment through 2015. These projections are from the Bureau of Economic Analysis of the U.S. Department of Commerce.

We test the sensitivity of the reference case results to changes in

- the start date for restructuring,
- the recovery of stranded costs, and
- the effects of restructuring on industrial rates.

We test the sensitivity with seven sensitivity scenarios that systematically vary these distinguishing characteristics of alternative approaches to restructuring.

Careful examination of the relationships, similarities, and differences among the average annual employment changes for the sensitivity scenarios reveals that each of these dimensions of restructuring— start date, treatment of stranded costs, and rates realignment— have important effects. We also illustrate that the difference in the effects of restructuring on employment across industries can be relatively large, depending on the electricity intensity of the industries and the electricity price effects of the restructuring policy option.